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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/730,143
Filing Date: December 09, 2003
Appellant(s): FUKUI, KOUTA

Sheldon J. Moss
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 14, 2006 appealing from the Office action mailed March 15, 2006.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,998,126	Toya et al	12-1999
4,332,889	Siga et al	06-1982
4,211,839	Suzuki et al	07-1980
5,958,668	Matsumoto et al	09-1999
1,096,310	Yoshioka et al	05-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

I. Claims 1, 3-5, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Toya et al (US Patent No. 5,998,126), Siga et al (US Patent No. 4,332,889) and Matsumoto et al (US Patent No. 5,958,668), Suzuki et al (US Patent No. 4,211,839) and EP 1096310 (EP'310).

Toya et al discloses a photothermographic material substantially as claimed. The photographic material contains a photosensitive silver halide material, a non-photosensitive silver salt of an organic silver salt, a reducing agent for the organic silver salt, binder, and wherein silver halide having grains size from 0.01 to 0.08 nm and silver halide including silver iodide and silver iodobromide grains having iodide content of 0.1 to 40 mole % in column 16, 50-64; the reducing agent including the bisphenols, antifoggant including halogen substituted organic compound, and the material absorb laser having wavelength of 300 nm to 700 nm. See column 34, claims 1-12; column 16, lines 50-64; column 32, lines 20-25; column 19, lines 34-39. Siga et al silver halide containing at least 30 mole % based on the silver halide component; more preferably at least 50 mole % based on silver halide component; the silver halide may include only silver iodide i.e. 100 mole % of silver iodide; the most preferred silver halide component consisting of silver iodide and silver bromide, and the molar ratio of silver iodide to silver bromide may be preferably 30/70 to 98/2, more preferably 50/50 to 95/5. The silver halide provides a practically usable post-activation type dry image forming material excellent enough in both stability and sensitivity. See column 6, lines 44-68 and column 2, lines 5-10. Matsumoto et al in column 18 discloses a bisphenol compound within the scope of the formula R-1 of the claimed invention. See compound in column 18, line 30 which contains a tertiary carbon and a methyl group.

Suzuki et al in column 15, lines 35-68, discloses a bisphenol compound and in column 16, lines 1-68 disclose that suitable reducing agent are selected depending upon the kind of organic silver salt used. Acceptable reducing agent/organic silver salt can be easily determined by a simple test. For example, a sample reducing agent is mixed with a coating solution containing the organic silver salt, and the mixed coating solution coated on a support. The reducing agent may be use as combination of two or more thereof. The combined use of two or more poly-phenolic reducing agent having alkyl group at the two substitution position adjacent to the hydroxyl-substituted position of the aromatic nucleus is effective for preventing discoloration upon exposure to light. EP'310 discloses the known bisphenol that a carbon bonding the benzene ring is secondary or tertiary or primary. See the bisphenol compound on pages 6-10 and the compound (I) on page 3. It would have been obvious to the worker of ordinary skill in the art at the time the invention was made to use one or more bisphenol compound known in the art such as taught in Suzuki et al and EO'310 with a reasonable expectation of preventing discoloration of the material obtained by the combination of Toya et al (US Patent No. 5,998,126), Siga et al (US Patent No. 4,332,889) and Matsumoto et al (US Patent No. 5,958,668), and thereby provide a material as claimed.

II. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable Toya et al (US Patent No. 5,998,126), Siga et al (US Patent No. 4,332,889) and Matsumoto et al (US Patent No. 5,958,668), Suzuki et al (US Patent No. 4,211,839) and EP 1096310 (EP'310) as applied to claims 1, 3-5, 8-10 above, and further in view of above, and further in view of Toya et al (US Patent No. 5,656,419). The polyhalogenate compound of formula (H) in claim 2 has been known Toya et al (US Patent No. 5,656,419) in column 2, lines 1-18; in column 12, compound

(II-a) to provide a photothermographic material with higher contrast. It would have been obvious to the worker of ordinary skill in the art at the time the invention was made to use the polyhalogen compound taught in Toya et al (US Patent No. 5,656,419) in the material obtained by the combination of the applied prior art above with a reasonable expectation of achieving a material with higher image contrast, and thereby provide a material as claimed.

(10) Response to Argument

There are two principal arguments made by the Appellants:

First, it was argued that none of the applied prior art of record, Toya et al (US Patent No. 5,998,126), Sigà et al (US Patent No. 4,332,889) and Matsumoto et al (US Patent No. 5,958,668), Suzuki et al (US Patent No. 4,211,839) and EP 1096310 (EP'310), disclose a specific combination of two orthobisphenols, namely (R-1) and (R-2) or (R-1) and (R-3) together. Second, the Appellants argue that references do not refer to unexpected and superior results obtained by the use of the present invention, namely high sensitivity and excellent tone (pure black image). The Appellants rely on the results in Table 1 of the specification on page 229, especially the results of the Experiment No. 5 and Experiment No. 6 in comparison with the result of the Experiment No. 4; and the results of the Experiment No. 8 and Experiment No. 9 in comparison with the results in Experiment No. 7.

It is the Examiner's position that the invention as being presented would have been found prima facie obvious to the worker of ordinary skill in the art at the time the invention was made. The appellants appear to argue each applied prior art separately, while the claims are rejected under 35 USC 103(a) over the combination of the applied prior art of record. One cannot show nonobviousness by attacking references individually where the rejections are based on

combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The claimed invention is directed to "A photothermographic material comprising a silver halide, a non-photosensitive organic silver salt, a reducing agent and a binder on at least one surface of a support, wherein the silver iodide is contained in the silver halide in amount of 40 mole % to 100 mole %, and the reducing agent contains a compound represented by the formula (R-1) and a second reducing agent includes a second compound from formula (R-2) or (R-3).". The non-photosensitive organic silver salt and binder are taught in all applied prior art, and are not critical in the claimed invention. The amount of silver iodide content in an amount of 40 mole % to 100 mole %, and the reducing agent of formula (R-1) in combination with either (R-2) and (R-3) is the principal issues that the Appellants consider as critical to their invention.

Toya et al (US Patent No. 5,998,126) discloses the halogen composition of photosensitive silver halide in column 16, lines 50-64, the silver iodide and silver iodobromide having silver iodide content of 0.1 to 40 mole % are among the silver halide useful as photocatalyst for silver salt of an organic acid. The silver iodide encompasses the scope of silver halide containing 100 mole % of iodide, and the silver bromoiodide having silver iodide 0.1 to 40 mole % encompasses the scope silver halide having iodide 40 mole % presented in the claimed invention. The worker of ordinary skill in the art would have selected the silver iodide or silver bromoiodide having iodide content of 40 mole % over silver chloride, silver chlorobromide, silver bromide, silver iodochlorobromide because the relationship between the silver bromide and silver iodide have been known and taught in Siga et al (US Patent No. 4,332,889) which in column 6, lines 43-68 disclose the relative amount of the silver iodide with respect to silver bromide to satisfy the

sensitivity condition and storage condition. It is disclosed that "from the view point of sensitivity of image forming material, the silver halide is desired to contains, beside silver iodide, at least 2 mole %, based on silver halide component, silver bromide and/or silver chloride, although the silver halide may include only silver iodide, i.e. 100 mole % of silver iodide. Furthermore, from view point of stability of the raw image forming material, it is desired that silver halide component contains, besides silver iodide, silver bromide than silver chloride. Therefore, the most preferred silver halide component consists of silver iodide and silver bromide. In this case, silver iodide and silver bromide may be provided in either a mixture thereof or mixed crystals thereof. The molar ratio of silver iodide to silver bromide may be preferably 30/70 to 98/2, more preferably 50/50 to 95/5.". The silver halide contains high silver iodide content of 30 mole % or higher would stabilize the photothermographic material from the view point of stability of the raw image forming. The worker of ordinary skill in the art would selected the silver bromoiodide having silver iodide content of 30 mole % or higher with an expectation of achieving such results.

The orthobisphenol reducing agent has been known in the art such as provided in the Appellants'argument and the rejections set forth in the paragraph (I) above, especially EP 1096310 (EP'310) on page 5, [0026] to [0037] which disclose that the "o-polyphenol compound" that may be any compound, so long as it is a reducing agent containing two phenol linked by "L" which represents a group –S- or a group $-CHR^9-$ where R^9 represents a hydrogen atom or an alkyl group. The ortho-phenol compounds are preferred because of their high heat-developability. EP'310, on page 4, [0022], discloses the photothermographic material comprises, on one side of a support, a photosensitive silver halide, a non-photosensitive silver

salt of an organic acid, a reducing agent for silver ions and a binder. It is characterized by containing (1) one or more phenol compounds as reducing agent; the phenol compound that preferred by EP'310 is shown on page 2, [0013], formula (I), wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 independently represent hydrogen atom or a group that can be substituted on a benzene ring and L represents a group –S- or a group $–CHR^9-$ where R^9 represents a hydrogen atom or an alkyl group. Particularly preferred are those compound where R^1 and R^6 independently represent secondary or a tertiary alkyl group. The groups R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are also discloses on pages 5, [0028] to [003].

The scope of the compounds of formula R-1, R-2 and R-3 presented in claim 1 is within the scope of the formula (I) on page 3, [0013] shown in EP'310.

The compound of formula (R-1) as claimed contains R^1 and $R^{1'}$ each represent an alkyl group having 3 to 20 carbon atoms, in which a carbon atom bonding to benzene ring is a secondary or a tertiary; R^2 and $R^{2'}$ each represent a methyl group; L represents L represents a group –S- or a group $–CHR^3-$ where R^{13} represents a hydrogen atom or an alkyl group having 1-20 carbon atoms.

The compound of formula (R-2) as being presented contains R^{11} and $R^{11'}$ each represent an alkyl group having 3 to 20 carbon atoms, in which a carbon atom bonding to benzene ring is a secondary or a tertiary; R^{12} and $R^{12'}$ each represent an alkyl having 2-20 carbon atoms; L represents L represents a group –S- or a group $–CHR^{13}-$ where R^{13} represents a hydrogen atom or an alkyl group having 1-20 carbon atoms.

The compound of formula (R-3) contains R^{21} and $R^{21'}$ each independently represent a methyl group or an alkyl group having 2 to 20 carbon atoms, in which a carbon atom bonding to

benzene ring is primary; R^{22} and $R^{22'}$ each represent an alkyl having 1-20 carbon atoms; L represents L represents a group –S- or a group –CHR^{23}- where R^{13} represents a hydrogen atom or an alkyl group having 1-20 carbon atoms.

The difference between the compounds of formula (R-1) and (R-2) is the alkyl groups at the para position, (R-1) contains a methyl group at para position whereas (R-2) contains an alkyl group having alkyl having 2-20 carbon atoms. The compound (R-3) contains primary alkyl at the ortho-position whereas the compounds (R-1) and (R-2) has secondary or a tertiary at the ortho position. These compounds are within the scope of generic formula (I) of EP'310 on page 3, [0013], and exemplified compounds on pages 6-10. EP'310 on page 5, [0029] discloses that R^1, R^3, R^6, and R^8 represent an alkyl group, more preferably a primary alkyl group having 1-20 carbon atoms, a secondary alkyl group having 3-20 carbon atoms or a tertiary alkyl group having 4-20 carbon atoms. Therefore, the substituent R^1 and $R^{1'}$, R^{11} and $R^{11'}$, and R^{21} and $R^{21'}$ of the claimed formula (R-1), (R-2) and (R-3) are within the scope R^1, R^3, R^6, and R^8 of formula (I) on page 3 preferred by EP'310 .

The compound of formula (R-1) as claimed is shown on page 7 of EP'310, compounds (I-5), (I-6) , wherein the compounds contain a methyl group at para-position and a tertiary alkyl having 4 carbon atoms at ortho-position. The compound (R-2) of the claimed invention is shown on page 8 of EP'310, compound (I-12), wherein the compound contains a tertiary alkyl having 4 carbon atoms at ortho-position and a ethyl group at para-position. The compound (R-3) of the claimed invention is shown on page 7 of EP'310, compound (I-10) wherein the compound contain an ethyl group at the ortho-position and a methyl group at para-position. The compounds represent by formula (R-1), (R-2) and (R-3) have been known and used as reducing agent for

silver ions such disclosed in EP 1096310 (EP'310). Moreover EP'310 discloses the use of one or more phenol compounds as reducing agent for the photothermographic material. Therefore, it would have been obvious to the worker of ordinary skill in the art at the time the invention was made to use one or more o-polyphenol compound taught in disclosed in EP'310 in combination with the use of silver iodide or bromoiodide having silver iodide content of 0.1 to 40 mole % such as taught in Toya et al (US Patent No. 5,998,126) with an expectation of achieving of material having high heat-developability such as mentioned in EP'310 on page 4, [0025]. The use of the reducing agent as in combination and the test to determine the suitability of the reducing agents are also taught in Suzuki et al (US Patent No. 4,211,839) shown in paragraph (I) above. Therefore, the applied prior art of record suggest the use of more than one o-polyhenol reducing agents so long as contains an o-polyhenol moiety within the scope of moiety on page 5, [0026].

The argument with respect to unexpected results such as high sensitivity and excellent tone (pure black) is not persuasive. First, the results are not commensurate with the scope of the claimed invention. The samples in Table-1 contain pure silver iodide, silver salt of an organic acid contains 96 % by mole of behenic acid, hydrogen bond-forming compound, development accelerator, color toning agent, polyhalogenate compound dispersion, phthalzaine compound, mercapto compound and pigment-1 dispersion. See Example 1 from pages 199-228, especially page 220 and pure silver iodide on pages 202-205, emulsions 1 to 3. The scope of the claims encompasses the scope of silver halide having silver iodide in an amount of 40 mole % and 100 mole % with the compound of formula (R-1) with either formula (R-2) or (R-3) while only the pure silver iodide as been used. The criticality of the whole range as claimed has been

demonstrated. The results shown in Table 1 are related to exemplified compounds I-1, I-9, 2-3, and 3-3 which related to the bisphenols containing a lower alkyl group, while the scope of the pf the formula (R-2) and (R-3) contains the alkyl group at ortho-position from 3-30 carbon atoms or 2-20 carbon atoms, and the alkyl group having carbon atoms from 2-20 and 1-20 at the para-position. See the scope of the compounds of formula I-1, I-9, 2-3, and 3-3 in comparison with the scope of the formula (R-1), (R-2) and (R-3). " The data is not reasonably commensurate in scope with the claims, which, as drafted, are broad in scope and cover mixtures of numerous untested compounds. Lindner, 457 F. 2d at 508, 173 USPQ at 358.".

Second, Table 1 on page 229, shows that the samples 1, 4 and 7 which contains the compounds 1-9, and 1-1, and the samples 5-6 and 8-9 which contains a combination of reducing agents 1-9 and 3-3; 1-9 and 2-3; 1-1 and 3-3 and 1-1 and 2-3 all represent the Appellants' inventive samples. Therefore, it is improper to compare the inventive samples against the inventive samples. Moreover, the results in samples 5-6 and 8-9 are related to the combination of reducing agent and the polyhalogenate compounds. However, polyhalogen compound-1 and polyhalogen compound-2 are not incorporated in claim 1. Therefore, the results are not commensurate with the scope of the claimed invention. Moreover, the results in samples 4-5 and 8-9 cannot be achieved in the absence of the organic polyhalogen compound-1 and polyhalogen compound-2. The Appellants are referred to the Experiment No. 4 vs the Experiment No. 11 wherein the Experiment No. 11 contains no organic polyhalogen compound-1 and polyhalogen compound-2 does not produce an effect found in the Experiment No. 4 which contains organic polyhalogen compound-1 and polyhalogen compound-2. Therefore, the selection of reducing alone (without the use of organic polyhalogen compound-1 and

polyhalogen compound-2) would not achieve the results such as sensitivity and color tone presented in the Appellants'argument. See the present disclosure on page 240, last paragraph, which discloses that "it is quite unexpected by selecting a specific ratio of the polyhalogen compound of the invention to the selected reducing agent, the difficult problems in the silver iodide can be resolved".

Third, the Appellants'argument with unexpected results of the Experiment No. 4 vs Experiment No. 5-6, and the Experiment No. 7 vs Experiments No. 8-9 are not well taken. The Experiment No. 4 shows same Dmin to the Experiments No. 5-6, higher sensitivity, and higher gradation that sensitivity and gradation of the Experiments No. 5-6. The color tone of "1" of the Experiment No. 4 is within the acceptable level (slightly bluish). See the definition of color tone on page 227. The fresh photographic performance of the Experiment No. 7 the same as of the Experiments No. 8-9 in term of Dmin, Gradation, Color tone and photothermographic storability. The sensitivity of the Experiment No. 7 is within the acceptable level which is higher than that of the comparative Experiment 1-3, 10-11. Therefore, there is not much difference in results with respect to the Experiment containing one reducing agent singly or a combination of two reducing agents presented in Table 1. These results are within the expected range of the one having an ordinary skill in the art at the time the invention was made.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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